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(71) Applicant: GICS & VERMEE, L.P. [US/US]; 92 Merriman Road, Sewickley Heights, PA 15143 (US).

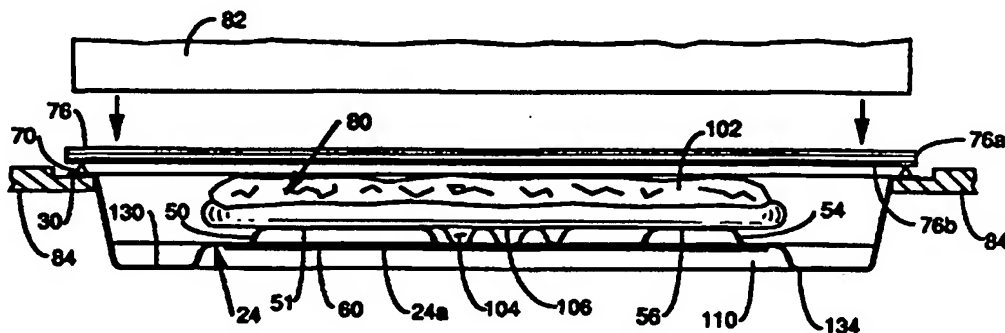
(72) Inventor: GICS, Paul, W.; 92 Merriman Road, Sewickley Heights, PA 15143 (US).

(74) Agent: RADACK, David, V.; Eckert Seamans Cherin & Mellott, 42nd floor, 600 Grant Street, Pittsburgh, PA 15219 (US).

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(54) Title: OVENABLE FOOD PACKAGE

**(57) Abstract**

A package for containing a food product. The package includes a base (24), a sidewall extending from the base, the sidewall terminating in a flange (30) and at least one projection (70) made of a meltable plastic material extending from at least a portion of the flange (30). The projection facilitates heat sealing of a paperboard lid (76) coated with plastic to the flange in order to enclose the food product (102) in the package.

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OVENABLE FOOD PACKAGE

BACKGROUND OF THE INVENTION

This invention relates to an ovenable food package, and more particularly to an ovenable food package having a base, a sidewall extending from the base which terminates in a flange and at least one projection made of a meltable plastic material extending from at least a portion of the flange. The projection facilitates heat sealing of a lid to the flange in order to enclose the package.

Packaged foods, and more particularly, the so-called "eat-in-box" foods are becoming increasingly popular with consumers. These foods offer the consumer a fast and convenient way to prepare and serve a meal. Typically, these packaged foods are bought in the frozen foods section of a supermarket, brought home and then cooked either in a conventional or microwave oven. The "eat-in-box" foods offer the added convenience of allowing the consumer to merely place the entire food package into the oven, and when cooked, eat the food right out of the package. Thus, there is no need to transfer the packaged food to a separate cooking container or to a dish.

There are currently two main types of "eat-in-box" packages. The first is a die cut paperboard container having a paperboard lid. The paperboard is coated with a plastic material, such as polyester, in order to make the paperboard ovenable. In addition, microwave susceptor material, such as aluminum, is interposed between the paperboard and the plastic material in order to make the package microwavable. In use, the lid is removed from the container and the container is placed directly in the oven. After cooking, the consumer can eat right out of the container. These paperboard containers,

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while effective, lack some rigidity and strength and are generally associated with lower cost frozen dinners and entrees.

The second type of "eat-in-box" package involves the use of a plastic container, made of crystalized polyethylene terephthalate (hereinafter referred to as "C-PETE") which is covered by a flexible aluminum foil lid. The container with the aluminum foil lid is then subsequently placed in a cardboard box. In order to cook these foods, the consumer must first remove the container having the lid from the box, remove the lid and then place the container without the lid into the oven. After cooking, the consumer can then eat the food right out of the container. As can be appreciated, this package requires more steps to cook than the paperboard container, but does offer the advantage of providing a sturdy, aesthetically pleasing container out of which the consumer can eat.

For many years, those skilled in the art have sought a way to combine a paperboard lid with a C-PETE container in order to obtain the advantages of the paperboard container (i.e., easy preparation) and the C-PETE container (sturdy container) without the attendant disadvantages. These efforts have met with failure due to the fact that a paperboard lid has not, heretofore, been able to be heat sealed to a C-PETE tray.

What is needed, therefore, is an ovenable food package having a paperboard lid secured to a C-PETE container in order to provide the advantages discussed above.

SUMMARY OF THE INVENTION

The invention has met the above need. A package for containing a food product is disclosed which comprises a base, a sidewall extending from the base, the sidewall terminating in a flange and at least one projection made of a meltable plastic material extending from at least a portion of the

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flange. The projection facilitates heat sealing of a paperboard lid coated with plastic to the flange in order to enclose the food product in the package. Preferably, the projection is triangular in cross-section having a base
5 disposed adjacent to the flange and tapering to a point opposite the base. The projection preferably extends about 0.10 to 0.50 inches from the flange.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained
10 from the following description of the preferred embodiment when read in conjunction with the accompanying drawings in which:

Figure 1 is a perspective view of the base and sidewall of the food package.

15 Figure 2 is a top plan view of the food package shown in Figure 1.

Figure 3 is a bottom plan view of the food package shown in Figure 1 also showing the label.

20 Figure 4 is a cross-sectional view taken along line 4-4 of Figure 2.

Figure 5 is a detailed cross-sectional view taken along line 5-5 of Figure 2.

Figure 6 is a cross-sectional view showing how the lid is heat sealed onto the base.

25 Figure 7 is a top plan view of the food package after the lid has been secured thereto.

Figure 8 is a cross-sectional view similar to Figure 6 only showing the lid being removed and the food package, with the food product disposed therein, resting on
30 the support surface of a microwave oven.

Figure 9 is a perspective view of another embodiment of the base and sidewall showing two sets of projections, one continuous and one discontinuous.

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Figure 10 is a cross-sectional view taken along line 10-10 of Figure 9.

DETAILED DESCRIPTION

Referring to Figures 1-4, an embodiment of an ovenable food package 20 is shown. This package 20 includes a non-circular base 22, which is shown in the Figures in the form of a square. The base 22 is preferably made of C-PETE embedded with microwave susceptor material, such as aluminum or alumina although it will be understood that other materials, such as paperboard coated with a high temperature coating, such as polyester, can be used. The materials used, the method of making these materials and the method of forming the base 22 are disclosed in co-pending and commonly owned United States Patent Application (Attorney Reference No. 120693-5) which is expressly incorporated by reference herein.

The base 22 consists of a floor portion 24 and a sidewall portion 26. The sidewall portion 26 terminates in a horizontal flange portion 30 that extends generally horizontally from the sidewall portion 26. The base 22 has integrally formed therein a plurality of raised ovals with two smaller ovals such as ovals 40 and 42 being sandwiched by two larger ovals 44 and 46 with this pattern being repeated around the base 22. The ovals, such as larger oval 44 has sidewall 50 (Figure 4) that extends upwardly and inwardly from the floor portion 24 of the base 22 and then terminates in a central plateau 51. Similarly, smaller oval 52 is raised from floor portion 24 and has a sidewall 54 that extends upwardly and inwardly from the floor portion 24 and terminates in a central plateau 56.

Although the ovals are shown having a central plateau, it will be appreciated that the upper portion of the oval can be rounded or can form any other shape (such as

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coming to a point) and still be considered within the scope of the invention.

Referring now to Figures 3 and 4, a label 60 is shown disposed on the underside 24a of floor portion 24. This label 60 can contain food product identification indicia 62 and nutritional information 64 which does not fit (or which is not desired for marketing reasons) on other portions of the food package. The label 60 is made of paper and is secured to the underside 24a of the floor portion 24 by an adhesive coating. As is known to those skilled in the art, the label 60 can be applied with label application machinery.

Referring to Figures 1, 2, 4 and 5, a projection 70 is shown extending from the horizontal flange portion 30. This projection 70 is made of a meltable plastic material, such as C-PETE. It will be appreciated that the projection 70 can be integrally formed with the horizontal flange portion 30 although the invention is not limited to an integrally formed projection 70 but also contemplates other methods of forming the projection. As can be seen in Figure 5, the projection 70 is solid and is triangular in cross-section and consists of a base portion 72 adjacent to the horizontal flange portion 30. The projection 70, which is not shown to scale in Figure 5 for purposes of ease of understanding and visualizing the invention, preferably extends about .010 to .050 inches from base portion 72 to point 74.

The projection 70 is shown as being continuous around the horizontal flange portion 30. The projection 70 facilitates the sealing of a lid 76 to the package 20. Referring to Figure 6, the base 22, holding a pizza 80, is shown. When it is desired to secure the lid 76 on the base 22, the lid 76, which is preferably made of paperboard 76a coated at least on its underside with a polyester coating 76b, is positioned over the package 22 containing the pizza 80. A heat seal die 82 is then brought into contact with the top of the lid 76 and presses the lid 76

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into contact with the projection 70. An anvil 84 is provided underneath flange 30 in order to provide support for pressing the lid 76 against flange 30. At the same time, the heat seal die 82 applies heat to the lid 76, which heat is transferred
5 through the lid 76 and then to the projection 70. The heat melts the polyester coating 76b to the projection 70 to form a tight secure bond between the lid 76 and the horizontal flange portion 30.

Another, less preferred, method of securing the lid
10 to the base is to provide a lid having a nickel coated mica surface which is subsequently electromagnetically secured to the flange.

It will be appreciated that the projection 70 provides several advantages. First, it provides a starting
15 point to facilitate melting of the coating 76b to the horizontal flange portion 30. That is, the polyester coating 76b of the lid 76 initially contacts the projection at point 74 and thus initially contacts the package 22 at a smaller surface area. It will be appreciated that it is much
20 easier to start to melt the point 74 because it has a smaller cross-sectional area, than it would be if there was no projection and the lid 76 would have to be melted directly onto horizontal flange portion 30. This allows a paperboard lid coated with polyester to be applied to a C-PETE base,
25 something those skilled in the art have been unable to do successfully up to this time.

Second, the projection 70, upon melting can absorb variations in the wall thickness of the horizontal flange portion 30. A problem in the prior art was that sealing a lid
30 directly to the horizontal flange, if the horizontal flange had variations in thickness, can create gaps so that heat from the sealing die was not transferred from the lid to the horizontal portion. Because there is no melting of the lid to the flange at these gaps, the lid sometimes is not properly
35 sealed, thus creating gaps through which air and contaminants

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could get into the package and through which the food in the package can leak out of the package. The projection 70 when melted will tend to flow and even out the variations in wall thickness so that a secure and tight seal is made between the
5 lid 76 and the horizontal portion 30.

Third, the package 22 itself may be formed such that portions of the horizontal flange portion 30 are at different heights. Without projection 70 this would mean that the lid would not contact the portions of the horizontal flange
10 portion 30 that are lower than other portions of the horizontal portion. This causes the problems mentioned above. With the projection 70, even if the package is formed so that the horizontal flange portion 30 is disposed at different heights, the lid 76 contacts the point 74 of the projection 70
15 all around the horizontal flange portion 30 thus insuring a tight and secure seal between the lid 76 and the horizontal flange portion 30.

Referring now to Figure 7, the package, as is sealed by the lid 76, is shown. The lid 76 contains score lines 90
20 which facilitates removing a portion of the lid 76 from the package. It is further preferred to provide a finger tab, defined by score lines 92. In use, a consumer breaks the score lines 92 and places a finger underneath the lid 76 and pulls the lid 76 away from the corner in which score lines 92
25 are disposed. Score lines 90 facilitate tearing of a portion of the lid 76. Score lines 90 and 92 define a removable portion 94. The removable portion 94 of the lid means is totally removed from the portion 96 of the lid that remains secured to the flange 30.

30 The removable portion 94 can be discarded, or, more preferably can be used during microwave ovening of the food product, as is described in co-pending and commonly owned United States Patent Application (Attorney Reference No. 120693-5).

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Referring now to Figure 8, pizza 80 is shown having toppings 102 placed thereon. The pizza 80 is supported on the plateaus of the ovals such as plateaus 51 and 56. It will be appreciated that an interior gap 104 is maintained between the bottom portion of the pizza crust 106 and floor portion 24. The interior gaps, such as gap 104, created between the pizza 80 and the base enhance the uniform heating of the pizza 80. Furthermore, the steam created by moisture in the frozen pizza which is heated is able to be vented from the bottom of the pizza 80 thus preventing sogginess of the pizza and creating a crispy crust. This steam also creates a "steam blanket" above the pizza 80 that enhances melting of the cheese on top of the pizza 80.

It will be further appreciated that when the base 22 with pizza 80 thereon is placed in a microwave oven, an exterior gap 110 is formed between the base 22 and the support surface 112 of the microwave oven in which the pizza 80 is cooked. The base 22 does not act as heat sink to draw away the heat created by the microwaves in cooking the pizza 80. This leads to uniform heating of the entire pizza 80 and also the elimination of so-called "cold spots" in the pizza 80.

The exterior gap 110 is created by a plurality of leg members, four of which, leg members 130, 132, 134 and 136 are shown in Figures 1-3. Preferably, the leg members 130, 132, 134 and 136 extend from the corners of the base 22 in order to maximize the exterior gap 110 created between the base 22 and the support surface 112 of the food heating apparatus. The leg members 130, 132, 134, 136 are further preferably integrally formed in the base 22. It will be appreciated that the exterior gap 110 also prevents the label 60 from coming into contact with support surface 112. This resists undesired transfer of the printing on the label 60 to the support surface 112.

Figures 9 and 10 show another embodiment of the ovenable food package in which like reference characters to

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those referred to in Figures 1-8 refer to like features in this embodiment. Figures 9 and 10 illustrate an embodiment in which there is one continuous projection 210 and a plurality of smaller discontinuous projections 212, 214, 216, 218, 220, 5 222, 224 and 226. As can be seen in Figure 10, projections 210 and 212 have a similar cross-sectional shape and positioning of the projections can be varied and still be within the scope of this invention.

While reference has been made throughout the 10 description to a food package containing a pizza, it will be appreciated that the invention can be used for packaging any type of food, including frozen dinner entrees and/or desserts.

It will be appreciated that an ovenable food package is provided that includes a C-PETE base having a projection 15 which facilitates heat sealing a lid.

While specific embodiments of the invention have been disclosed, it will be appreciated by those skilled in the art that various modifications and alterations to those details could be developed in light of the overall teachings 20 of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the appended claims and any and all equivalents thereof.

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WHAT IS CLAIMED IS:

1. A package for containing a food product, said package supporting said food product when said food product is placed into a food heating apparatus having a support surface, said package comprising:

- 5 a base;
 a sidewall extending from said base, said sidewall terminating in a flange; and
 at least one projection made of a meltable plastic material extending from at least a portion of said
10 flange, said projection facilitating heat sealing of a paperboard lid coated with plastic to said flange in order to enclose said food product in said package.

2. The package of Claim 1, wherein
 said projection is triangular in cross-section
15 having a base portion adjacent to said flange and tapering to a point opposite said base.

3. The package of Claim 2, wherein
 said projection extends about .010 to
 .050 inches from said flange.

- 20 4. The package of Claim 1, wherein
 said base and said sidewall are made of a plastic material.

5. The package of Claim 1, wherein
 said plastic material is C-PETE.

- 25 6. The package of Claim 1, wherein
 said base and said sidewall are made of paperboard coated with a plastic material.

7. The package of Claim 6, wherein
 said plastic material is polyester.

- 30 8. The package of Claim 7, including
 a microwave susceptor material disposed on said base.

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9. The package of Claim 1, including
a lid having an inner surface that is coated
with a plastic material, said inner surface contacting said
projection such that said inner surface can be heat sealed to
5 said flange.

10. The package of Claim 1, wherein
said base is constructed and arranged such that
an exterior gap is created between a portion of said base and
said support surface of said food heating apparatus when said
10 package is placed in said food heating apparatus.

11. The package of Claim 10, including
food product identification indicia printed on
said portion of said base that is spaced from said support
surface when said package is placed in said food heating
15 apparatus such that said food product identification indicia
does not transfer to said support surface when said food
product is heated in said food heating apparatus.

12. The package of Claim 11, wherein
said food product identification indicia is
20 printed on a label which is secured to said portion of said
base that is spaced from said support surface.

13. The package of Claim 12, including
a plurality of leg members extending from said
base to create said exterior gap.

25 14. The package of Claim 13, wherein
said base is generally rectangular in shape;
and

said leg members extend from each of the
corners of said base.

30 15. The package of Claim 1, wherein
said projection is continuous around said
flange.

16. The package of Claim 1, wherein
said projection is discontinuous around said
35 flange.

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17. The package of Claim 1, including
a second projection spaced from said
projection.

18. The package of Claim 1, wherein
5 said base is constructed and arranged such that
at least one interior gap is created between said food product
and said base when said food product is disposed on said base.

19. The package of Claim 18, wherein
said base has at least one oval extending
10 therefrom, said oval including a central plateau portion on
which said food product is supported when said food product is
being heated in said food heating apparatus.

20. The package of Claim 19, including
a plurality of ovals extending from said base,
15 said ovals defining a plurality of said interior gaps.

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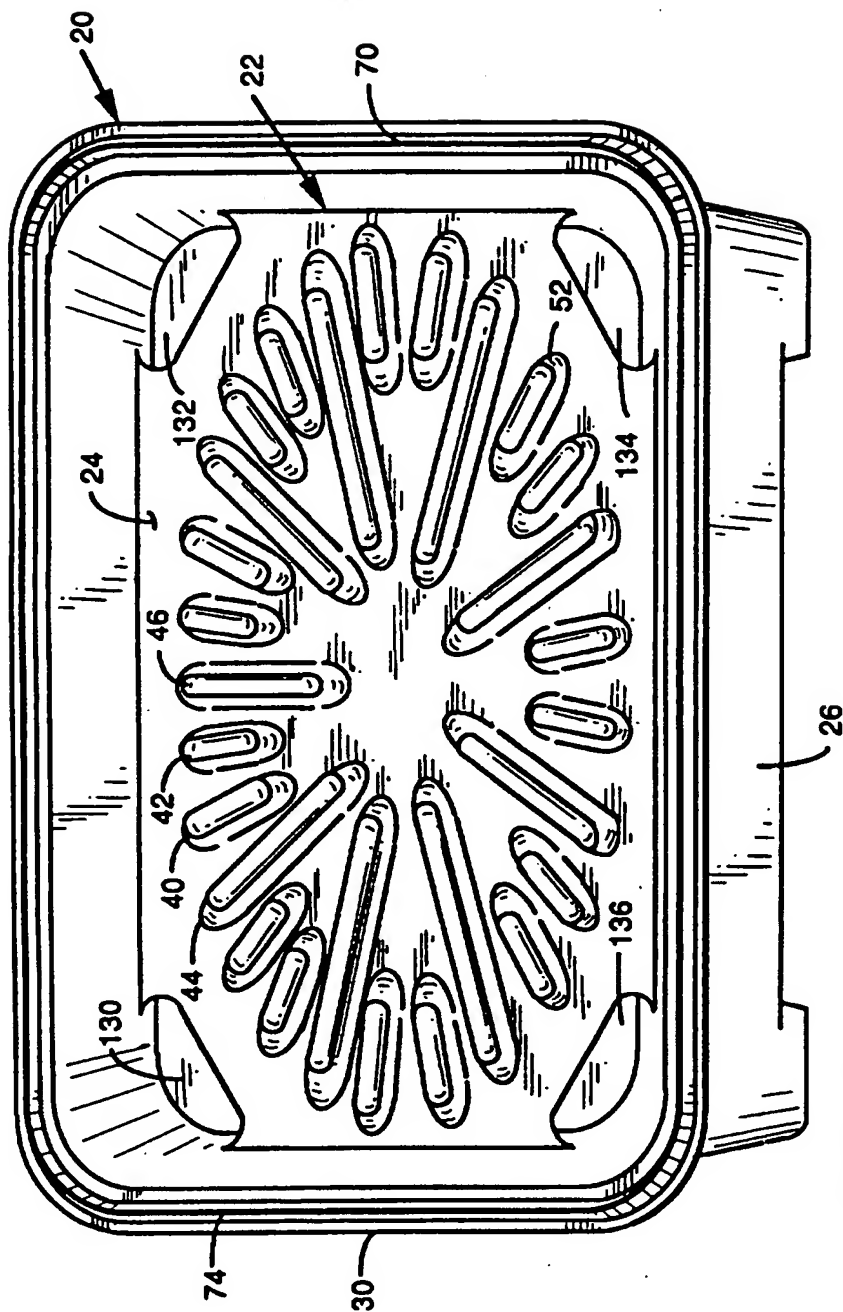


FIG. 1

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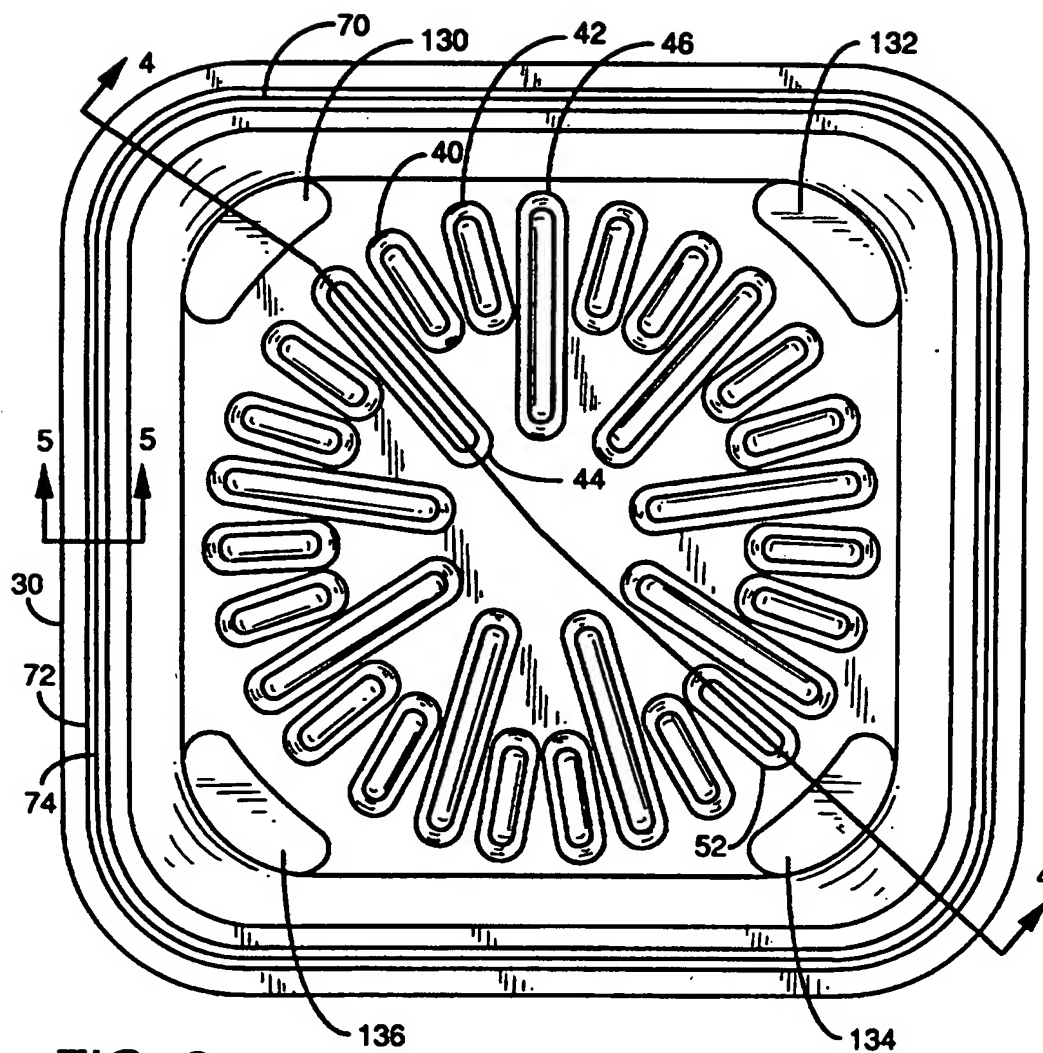


FIG. 2

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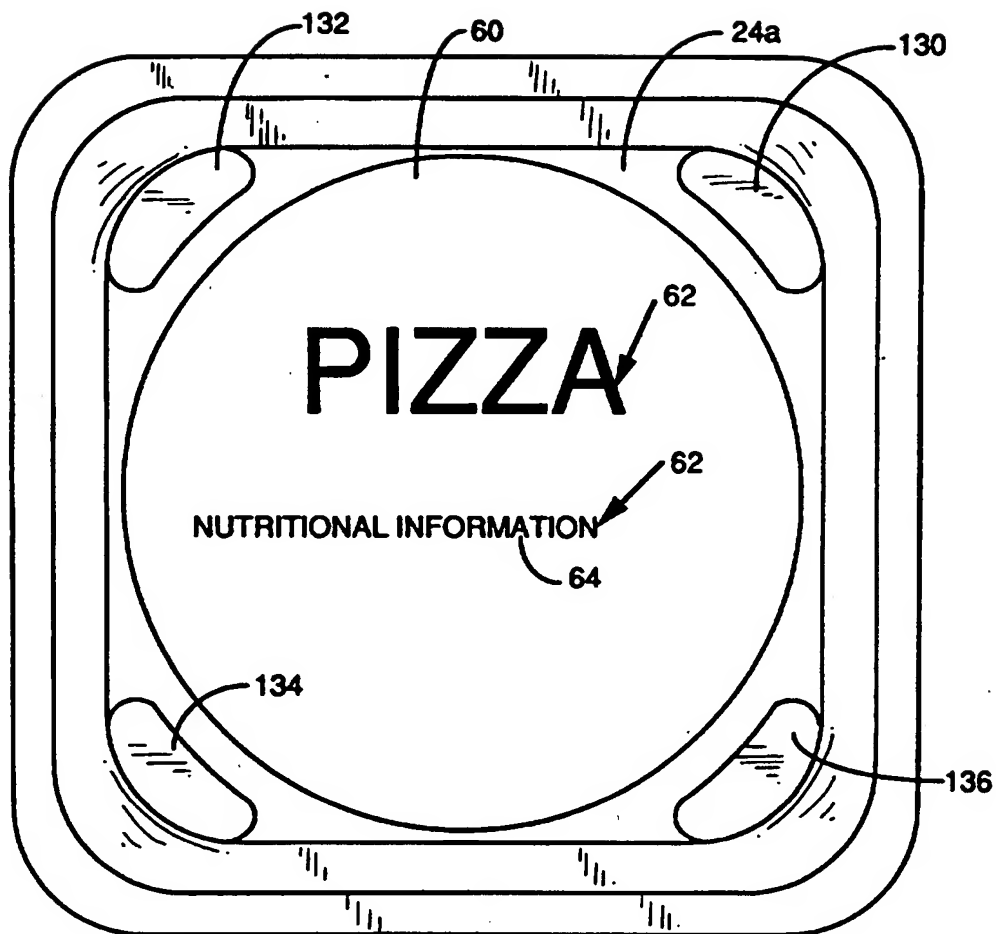
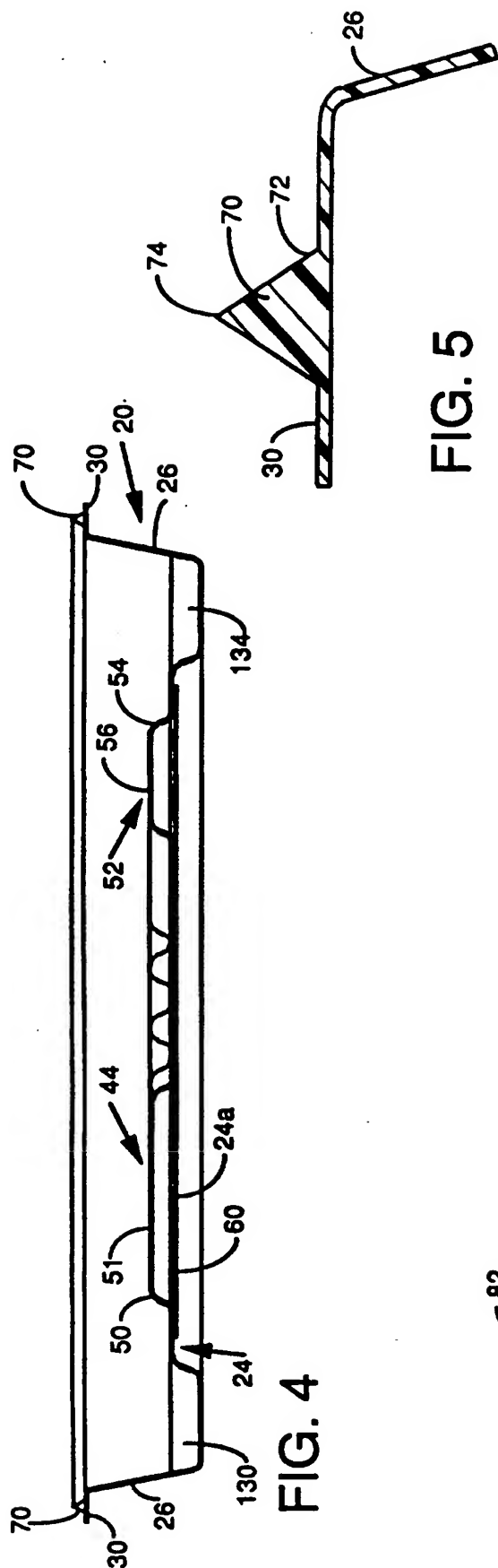


FIG. 3



F/G. 5

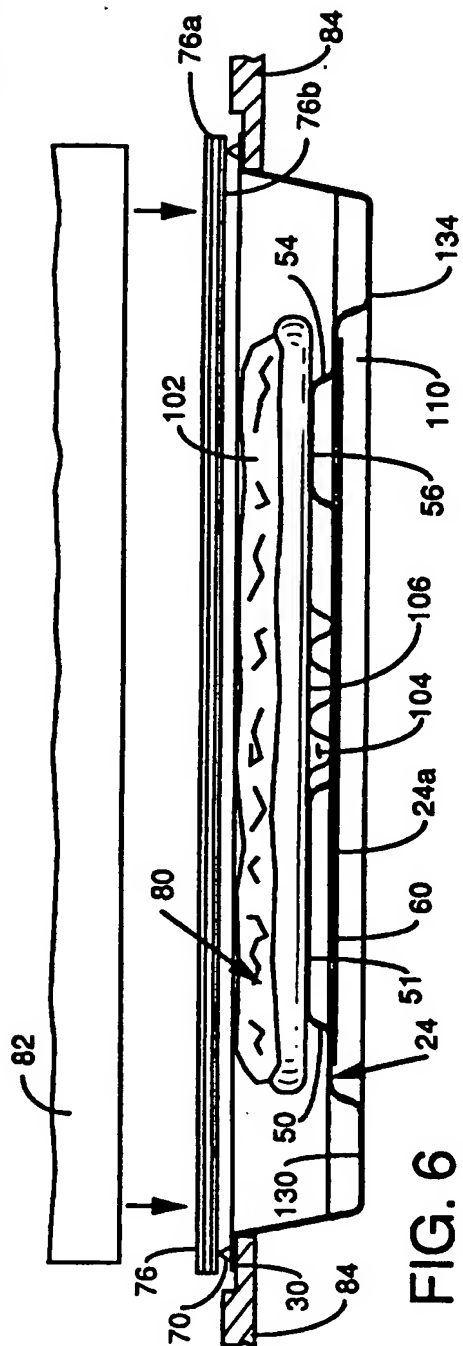


FIG. 6

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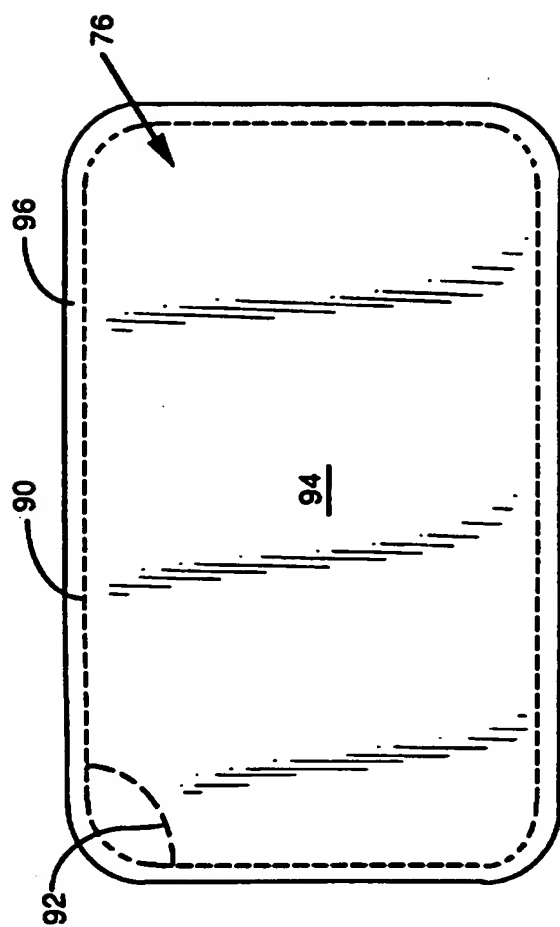


FIG. 7

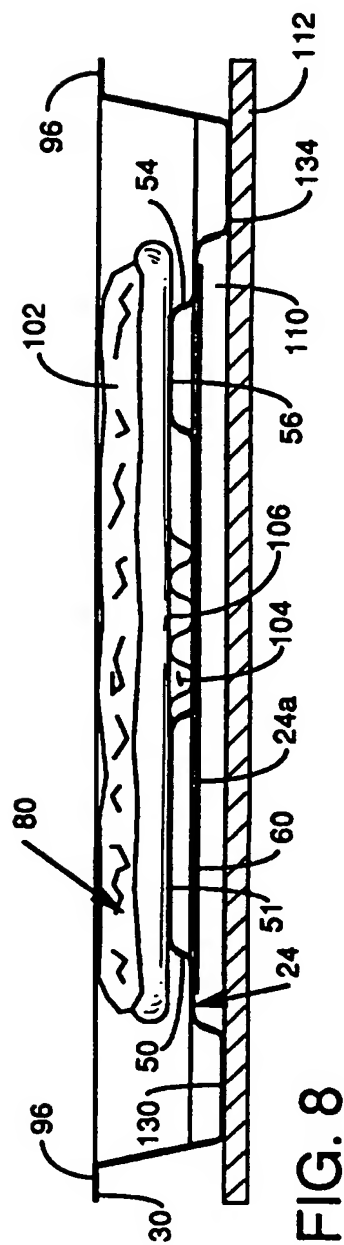


FIG. 8

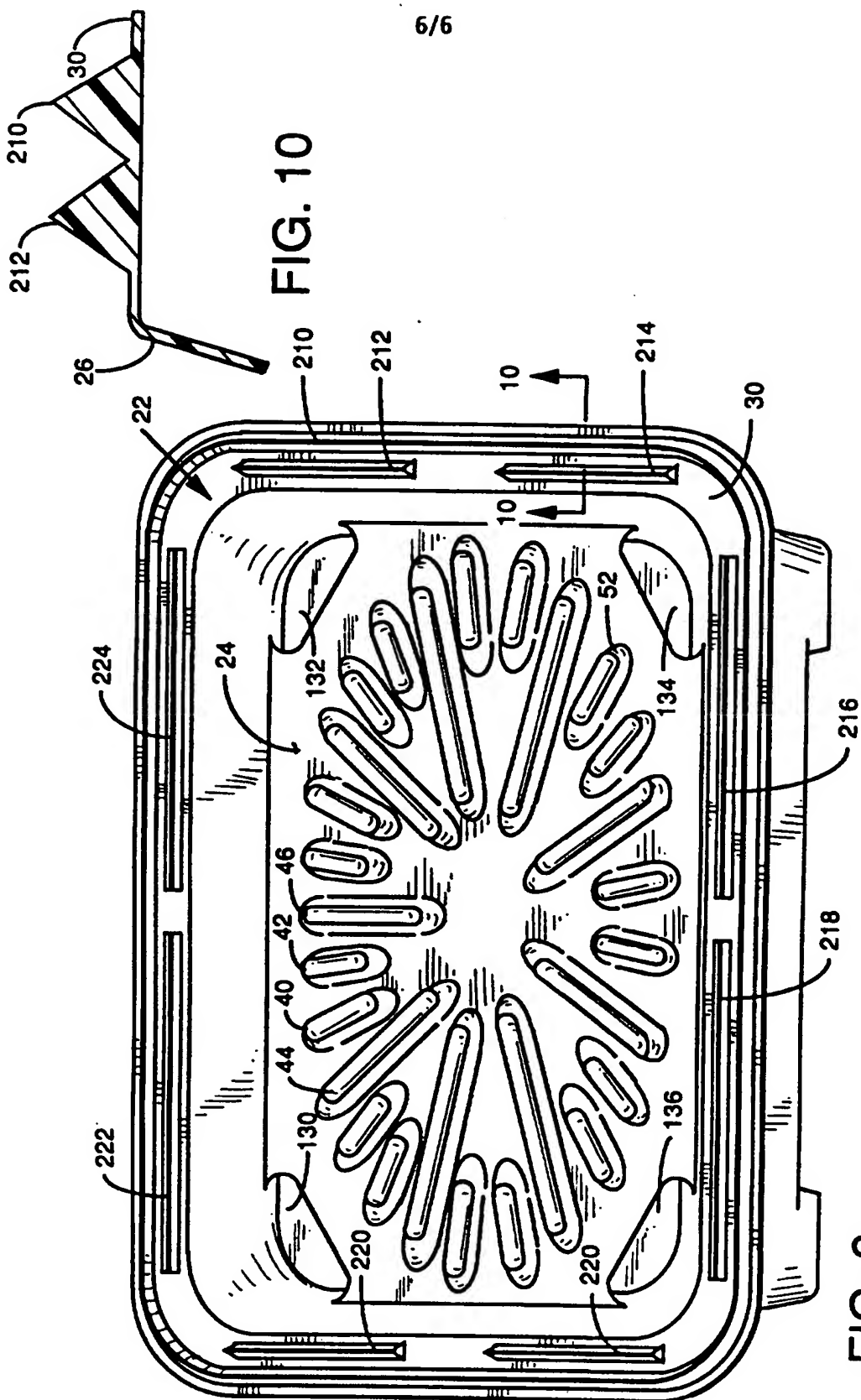


FIG. 9

FIG. 10

INTERNATIONAL SEARCH REPORT

Intern. Application No
PCT/US 95/09605

A. CLASSIFICATION OF SUBJECT MATTER IPC 6 B65D77/20 B65D81/34 B65D25/20		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 6 B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,37 33 133 (ALUMINIUM WALZWERKE) 13 April 1989	1,4,9, 15-17
Y	see the whole document	2,3,5-8, 10-14, 18-20
Y	FR,A,2 545 470 (MONOPLAST S.A.) 9 November 1984	2,3
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Y	EP,A,0 399 981 (AB CERBO) 28 November 1990 see the whole document	5
Y	EP,A,0 063 108 (AKERLUND & RAUSING) 20 October 1982 see the whole document	6-8
-/--		
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016		Authorized officer <div style="text-align: center; font-weight: bold;">Pernice, C</div>

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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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